DEF-03 REDUCE THE SCOPE OF DOE'S STOCKPILE STEWARDSHIP PROGRAM

Savings from the 1995 Plan	Annual Savings (Millions of dollars) 1996	1997	1998	1999	2000	Cumulative Five-Year Savings
Budget Authority	55	122	220	247	276	920
Outlays	28	80	161	219	258	745

For the first four decades of the nuclear age, the United States developed, tested, and produced nuclear weapons for its arsenal. The Department of Energy (DOE) and its predecessors have been responsible for that task. During much of the Cold War, the arsenal held over 25,000 warheads of more than a dozen different types. The weapons were designed and developed at the three weapons laboratories (Los Alamos, Lawrence Livermore, and Sandia) and tested at the Nevada Test Site; materials and components for the weapons were produced at more than a dozen facilities across the country.

The end of the Cold War has changed the requirements for the arsenal. In response to the second Strategic Arms Reduction Treaty (START II), the United States plans to keep roughly 5,000 warheads of 10 different types in its active inventory beyond 2003. DOE has started to consolidate its production facilities as it adjusts to its declining workload.

The United States, along with all other nuclear powers except China, has also unilaterally halted all underground testing. To establish a permanent worldwide moratorium, it has been negotiating a comprehensive test ban (CTB) treaty that will make it difficult for any country to develop new weapons. The Administration would like the treaty to be completed as soon as possible.

To preserve its ability to ensure, over the long run, the reliability and safety of the weapons that remain in the nuclear stockpile under a CTB, the Department of Energy has developed a stockpile stewardship program. One goal of that program is to increase funding for activities such as computer simulations, hydrodynamic testing, and fusion research that will become increasingly important in the absence of underground testing. Another goal of the plan is to ensure that the weapons labs continue to attract talented scientists by providing challenging work and state-of-the-art facilities.

To carry out this plan, DOE will continue to operate both of its weapons design labs (Los Alamos and Lawrence Livermore) and its engineering lab (Sandia). It will also construct several new facilities --including the Dual-Axis Radiographic Hydrotest (DARHT) facility at Los Alamos for hydrodynamic tests and the National Ignition Facility (NIF) at Lawrence Livermore for research on the fusion portions of the weapons--to provide data on the reliability and safety of weapons as they age. In addition, DOE plans to keep the Nevada Test Site operational so that it can conduct hydronuclear experiments (hydrodynamic tests in which a very small nuclear explosion--equivalent to a few pounds of TNT--actually occurs). The laboratories also plan to spend some $220 million annually for cooperative research and development agreements (CRADAs) and other technology transfer initiatives in which laboratory scientists work with industry to share technology with the private sector.

Under the stewardship program, DOE would spend $1.6 billion annually for weapons research, development, and testing (RD&T), or about $350 million less than it spent in 1993. However, the annual expenditures for RD&T under the Administration's plan, after adjusting for inflation, would still be about the same as in 1980 when the United States was both designing new warheads and maintaining an arsenal of some 25,000 warheads. Further reductions in spending may therefore be possible.

This option would reduce the scope of the stewardship program by consolidating the two design laboratories, forgoing all hydronuclear testing activities at the Nevada Test Site, and trimming funding for CRADAs by one-third. To offset the effect of those cuts, this option would gradually increase funding for other stewardship activities until it reached $60 million a year in 1998. Taken together, those policy changes would save $55 million in 1996 and $276 million annually by 2000 compared with the Administration's 1995 plan. From 1996 through 2000, this option would save a total of $920 million.

For illustrative purposes, the above savings assume that weapons activities would be consolidated at Los Alamos over a period of five years; Lawrence Livermore would no longer have the designing of nuclear weapons as its primary focus. Los Alamos designed eight of the 10 types of nuclear weapons that are likely to remain in the stockpile. To ensure that the two other warhead types could be reliably maintained, some designers from Livermore would have to move to Los Alamos. This option would maintain a cadre of weapons scientists at Livermore to provide peer review for Los Alamos's efforts. To ensure that those scientists have challenging work, Livermore would retain substantial computational facilities for modeling the complex processes inside nuclear weapons and would proceed with DOE's plans to build the National Ignition Facility. (The savings would be lower if stewardship activities were consolidated at Lawrence Livermore because that would involve moving more facilities and relocating more weapons designers. Also, the environmental issues raised by introducing new nuclear facilities into the populous area surrounding Livermore could prove difficult to overcome.)

By forgoing hydronuclear tests, DOE could shut down all testing operations at the Nevada Test Site and save $140 million annually by 2000. The purpose of hydronuclear experiments is to test the nuclear reactions in the plutonium pit in the presence of neutrons from a warhead's neutron generator. Those tests are controversial because they involve an actual, albeit very small, nuclear explosion and for safety reasons are conducted underground. Some of the countries negotiating the CTB and some groups within the United States oppose such experiments because they could allow established nuclear powers to continue to design and test new weapons. Thus, critics argue that hydronuclear experiments run counter to the spirit of both the test ban and the Nuclear Non-Proliferation Treaty, which commits the nuclear powers to work toward disarmament. The tests are also contentious because they carry a remote risk of a larger nuclear explosion if they are not conducted properly, although such an explosion would be contained underground.

Finally, by trimming funding for CRADAs by one-third, this option would reduce the amount of money flowing into the laboratories for technology transfer. Cuts would be phased in over two years so that the labs could honor existing contracts. The additional funding for basic stewardship under this option would enable laboratory scientists to refocus their efforts on weapons activities.

The central question underlying this option is, What is required to ensure the reliability and safety of the stockpile in the future if the current moratorium on underground nuclear testing is made permanent? DOE's stewardship program is the Administration's answer, although the laboratories feel they need at least an additional $60 million annually to support basic stewardship. This option preserves much of what the stewardship plan calls for, including DARHT and NIF, but does not support hydronuclear testing or fund two full design labs.

Some people may feel that this option cuts the program too deeply. They believe that DOE's stewardship program is the minimum effort necessary to maintain the stockpile without underground testing. Cuts would not be prudent, they argue, because scientists will need new facilities to obtain data on reliability that was formerly provided directly by underground nuclear testing. Supporters of DOE's stewardship program also object to the consolidation proposed here. In their view, two design laboratories are essential for providing a robust stewardship program: competition and peer review would continue to be important, even in the absence of underground testing. Furthermore, refocusing the efforts of one lab away from weapons research would eliminate its central unifying mission (and thus its motivation for excellence) without replacing that focus with an equally important mission. Consolidation would also result in the loss of some facilities that could not easily be

transferred to the other lab. Advocates of the stewardship program also disagree with this option's proposal to forgo hydronuclear experiments, because it would surrender a diagnostic tool that, in their view, would be very important in measuring how age affects the complex interactions within the plutonium pit during the early stages of detonation.

Some critics argue that the stewardship program should be cut further than suggested in this option. Some believe that keeping part of a second lab, increasing money for basic stewardship, and building DARHT and the $1.1 billion National Ignition Facility are unnecessary to support the stockpile. In their view, those facilities may allow DOE scientists to continue designing and testing weapons and to circumvent a test ban treaty. Even if DOE has no intention of designing new weapons, they argue, the perception of such a capability may make it difficult to convince nonnuclear countries--from whom the United States would like continuing support for the Nuclear Non-Proliferation Treaty--that the United States has really given up testing. Critics also contend that the nation cannot afford to keep a portion of a second design lab or NIF; they argue that if NIF can help scientists to understand how to harness fusion for civilian energy, as supporters claim, it should be funded outside the nuclear weapons program.

DEF-04 FOCUS THEATER MISSILE DEFENSE EFFORTS ON CORE SYSTEMS

Savings from the 1995 Plan	Annual Savings (Millions of dollars) 1996	1997	1998	1999	2000	Cumulative Five-Year Savings
Budget Authority	300	300	500	600	880	2,580
Outlays	130	250	370	500	620	1,870

The Strategic Defense Initiative, which President Reagan started in 1983, focused solely on protecting the United States from a deliberate large-scale attack by Soviet ballistic missiles. The Bush Administration added an effort to protect U.S. troops and allies' civilian populations from attack by shorter-range "theater" missiles such as the Scuds used in the Persian Gulf War. The Clinton Administration--citing the urgency of the threat posed by theater ballistic missiles and the end of the Cold War--has reoriented the program to give priority to developing theater missile defenses (TMDs). It has also de-emphasized the effort to develop so-called national missile defenses, delaying indefinitely a decision to deploy defenses to protect the United States against longer-range missiles. To reflect those changes, it has renamed that effort the Ballistic Missile Defense (BMD) program. This option would make cuts in theater missile defenses beyond those proposed by the Administration.

According to its plan for 1995, the Administration will spend about $19 billion for all BMD efforts from 1996 through 2000--an average of roughly $3.8 billion a year. Of that, an average of $2.6 billion will be spent on TMD each year: $2.3 billion by the Ballistic Missile Defense Organization, and almost $200 million by the Air Force and the Army on programs that are funded outside the organization's budget.

Under its restructured TMD program, the Administration would deploy a core package that includes both point defenses (which can protect relatively small targets like airfields or command facilities) and area defenses (to protect areas a few hundred kilometers in diameter). Specifically, the Army would deploy a point defense called the Patriot Advanced Capability 3 (PAC-3) and an area defense called Theater High-Altitude Area Defense (THAAD). The Navy would develop a sea-based point defense using the Standard missile that the Navy deploys on its Aegis destroyers and cruisers.

In addition to the core systems, the Administration plans to continue developing three advanced-capability theater defenses: a Navy sea-based area defense; a mobile Army point defense called the Corps Surface-to-Air Missile (Corps SAM); and an Air Force boost-phase interceptor that would destroy missiles early in their flight. All three will be funded at a modest level through 1999. Because of budget constraints, however, the Ballistic Missile Defense Organization expects to deploy only one of those systems. The extent to which it develops the other two after 1998 will depend on future budget conditions.

To increase the area that THAAD and the Navy's area defense can protect, the Administration is developing space-based sensors, a constellation of satellites called Brilliant Eyes. The Administration would also develop a battle management system to enable these TMD systems to function effectively together. Finally, the Administration plans to continue paying for much of Israel's effort to develop the Arrow missile as an area defense system.

Some Members of Congress have expressed concern about the cost of developing so many apparently redundant systems, including both land- and sea-based point and area defenses. Some Members also question why the United States should bear all of the cost to develop area defenses like THAAD that would be used primarily to protect the civilian populations of other nations. Other critics are concerned

that the Brilliant Eyes space-based sensor proposed by the Administration would violate the terms of the Anti-Ballistic Missile (ABM) Treaty.

This option would save money by developing only the core TMD programs: Patriot PAC-3, the Navy point defense, THAAD, and a battle management system. The three advanced-capability systems and the Brilliant Eyes program would be terminated, as would Air Force funding for boost-phase interceptors (roughly $100 million a year). This option would keep all non-TMD funding at the Administration's planned level but would eliminate funding for Israel's Arrow missile.

Relative to the Administration's 1995 plan, these actions would save $300 million in 1996 and nearly $2.6 billion over the next five years. Savings relative to the Administration's plan for 1996 and beyond would be nearly the same because the Administration has not changed its plan significantly.

By canceling the Navy's area defense system, this option would reduce the flexibility of U.S. commanders during a crisis. Although sea-based defenses are limited to defending coastal regions, they can be deployed to a region quickly and do not require access to secure airfields to be airlifted into the theater--a limitation of land-based systems like THAAD. The United States can also deploy sea-based defenses without having to obtain basing rights in another country, a process that could cause domestic political difficulties for some friendly governments. This option would preserve the capability to defend small areas such as ports or amphibious landings from the sea. But without the Navy's sea-based area defense system, the United States would not be able to defend larger areas such as cities until THAAD could be deployed. Nor could it use forward-based ships to defend large areas of Europe or Japan against attack from the Middle East or North Korea, respectively.

Changes under this option would also limit the area that could be defended by the remaining systems. Canceling Brilliant Eyes would limit the area that THAAD could defend because ground-based sensors would take longer to detect and track incoming missiles, thereby reducing the range at which those missiles could be intercepted. Canceling Brilliant Eyes could also affect the capability of a future national missile defense system, if the United States eventually chooses to deploy one. In addition, terminating boost-phase interceptor programs would halt work on systems that have the potential to be effective against missiles armed with nuclear or chemical warheads if technical problems can be overcome. Finally, cutting off funding for Israel's Arrow area defense missile would jeopardize a critical program for one of the United States' closest allies, which currently faces a real threat from ballistic missiles.

Notwithstanding those disadvantages, under this option the United States would still deploy capable land- and sea-based point defenses, a land-based area defense, and a battle management system, all according to the schedule proposed by the Administration. By eliminating all TMD funding beyond the core systems, this option would halt several programs early in their development phase. In addition to the savings between 1996 and 2000, those actions could save significant sums beyond 2000, when the advanced TMD systems and Brilliant Eyes would have entered full-scale development and production. (At current and projected budget levels, procurement funds may never be available for many of these systems.) This option would also eliminate payments to Israel to support development of the Arrow missile. In this period of tight budgets, it may be inappropriate to spend U.S. funds to develop a foreign system that the United States has no intention of buying.

In addition to lowering costs, canceling Brilliant Eyes would eliminate the concerns of some critics that the sensors--by effectively substituting for ABM radars--would significantly increase the area that THAAD could defend and thus would violate the ABM treaty. The contractor building THAAD has stated that the system's capability does not depend critically on Brilliant Eyes and that such sensors are needed only to defend the large areas required for national missile defenses. Since the Administration has delayed indefinitely a decision to deploy national missile defenses, space-based sensors such as Brilliant Eyes may not be required for many years, if at all.

DEF-05 REDUCE THE NUMBER OF AIRCRAFT CARRIERS AND AIR WINGS TO 10

Savings from the 1995 Plan	Annual Savings (Millions of dollars) 1996	1997	1998	1999	2000	Cumulative Five-Year Savings
Budget Authority	460	960	1,000	1,030	1,070	4,520[a]
Outlays	330	760	900	970	1,030	3,990

NOTE: This table includes estimated net savings in the federal budget. See Appendix A for estimated savings in the Department of Defense budget.

a. Estimated savings include a notional air wing that is based on the Navy's estimates of size and composition.

The aircraft carrier is the centerpiece of the U.S. Navy. The Administration's 1995 plan calls for a fleet of 12 carriers in 2000 (11 active plus one carrier, manned partly by reserves, that could also be used for training) with 10 active air wings and one in the reserves to provide combat capability for those ships. The carriers would be accompanied by a mix of surface combat ships--usually cruisers and destroyers--and submarines that can attack planes, ships, and submarines that threaten the carrier. These surface combatants and submarines can also attack targets on land.

Some policymakers have argued that the United States does not need a force of 12 carriers in the aftermath of the Cold War. The total capability of all U.S. tactical aircraft in the Navy and Air Force would substantially exceed that of any regional power that seems potentially hostile. Cuts may therefore be acceptable.

Moreover, the capabilities of U.S. ships are unsurpassed worldwide. The Navy has ships other than carriers, including large flat-deck amphibious vessels, that can assist in maintaining a U.S. naval presence overseas in peacetime. Perhaps for these reasons, some policymakers have contemplated carrier force levels below those recommended by the Administration's plan. In 1990, before the breakup of the Soviet Union, the Chairman of the Senate Committee on Armed Services recommended a force of 10 to 12 carriers. And during the 1992 campaign, President Clinton called for a Navy with 10 carriers.

This alternative would retire two conventionally powered carriers early so that by 2000 the Navy would have 10 carriers (nine active carriers and one manned partly by reserves that could also be used for training). In addition, from the force of 10 active and one reserve air wings, it would eliminate one active air wing and leave nine active air wings and one reserve wing to match the number of carriers.

Compared with the 1995 plan, which has 12 carriers and 11 air wings, savings could total about $460 million in 1996 and roughly $4.5 billion over five years. (The Administration's 1996 budget does not materially change its 1995 plan.) Costs to decommission the retiring ships would offset some of the savings, but CBO does not have the data to estimate their magnitude. The Navy might realize procurement savings, also not included in the savings shown above. For example, the Navy might not need to buy as many DDG-51 destroyers for the smaller number of carrier battle groups (see DEF-08 for a discussion of the DDG-51). Also, the cut in air wings would reduce the number of required aircraft (see DEF-09 for a discussion of changes in procurement of naval aircraft).

According to former Secretary of Defense Les Aspin, reducing the force to 10 carriers would not impair the ability of the U.S. military to fight and win two regional wars that start nearly simultaneously. He has argued, however, that having fewer ships would limit the Navy's ability to keep three carriers deployed overseas most of the time. In peacetime,

some carriers spend time in repair; others are kept at U.S. ports to provide stateside duty time for their crews; still others are in transit to their operating stations. The Navy argues that only one-quarter or less of the carrier fleet can be deployed overseas in peacetime. Thus, a reduction to a fleet of only 10 carriers might mean that, much of the time, one carrier fewer on average could be deployed overseas compared with the level under the Administration's 1995 plan.

It may be possible, however, to maintain deployments with a smaller fleet. The factors the Navy used throughout the 1980s implied that about a third of the carrier fleet would be deployed overseas. Moreover, the Navy kept five of its 13 carriers overseas in the late 1970s. Based on that experience, the fraction of the carrier fleet that might operate routinely overseas is larger than the Navy's current formula would suggest, although according to the Navy such intensive use of carriers led to a number of problems.

Furthermore, a reduced overseas presence may be acceptable in the post-Cold War world. The United States would still have at least two carriers deployed overseas at any one time, and possibly more if the Navy deployed a larger fraction of its carrier fleet. However, some missions, such as those requiring substantial numbers of fixed-wing aircraft, can be performed only by carriers. For example, carrier aircraft can be used to hit moving targets at longer ranges. In a crisis requiring such capability, a smaller force might mean an increase in the time before U.S. combat capability becomes available.

Alternatively, the Navy could use surface combatants other than the aircraft carriers to maintain a naval presence in peacetime and to assist in responding to crises. For example, it could use groups of ships centered around as many as 12 large flat-deck amphibious assault ships (smaller carriers) that are designed to transport the Marines and their equipment; those ships can embark helicopters and Harriers (Marine Corps attack aircraft that can land and take off vertically) and are as large as the aircraft carriers of many other countries. These Amphibious Ready Groups are fully capable of handling some missions usually performed by carriers, such as conducting limited strikes and evacuating noncombat personnel.

The Navy may also be able to meet some of its deployment requirements with groups of surface combatants that do not include any kind of carrier. Those formations have been made possible because the offensive capabilities of surface combatants have been augmented with the Tomahawk missile for attacking targets hundreds of miles inland and because their defensive capabilities have been enhanced by the Aegis system for defense against attacks from aircraft and antiship missiles. With the demise of the Soviet Union, a substantially reduced threat to U.S. ships also contributes to the feasibility of maintaining a presence with ships other than carriers. The Navy has already used formations without aircraft carriers to provide overseas presence. None of the formations, however, is as capable as a carrier battle group.

However, if policymakers continue to use aircraft carriers for overseas presence at current levels but the Navy has fewer vessels available, the time that ships spend at sea would have to increase. That would mean that the high-quality sailors the Navy needs would be spending more time away from their homes and families, thus making it harder for the Navy to retain them.

DEF-06 CANCEL PROCUREMENT OF THE THIRD SEAWOLF SUBMARINE

Savings from the 1995 Plan	Annual Savings (Millions of dollars) 1996	1997	1998	1999	2000	Cumulative Five-Year Savings
Budget Authority	1,260	0	0	-240[a]	0	1,020
Outlays	-140[b]	340	360	160	60	780

a. Net cost to reconstitute a shipyard in 1999.

b. Outlays incurred in shutting down a shipyard completely offset savings in 1996.

The Seawolf submarine was designed to counter projected improvements in Soviet submarines. Like the SSN-688 (Los Angeles class) submarine that it follows, the Seawolf's mission is to detect and destroy enemy submarines and surface ships and to launch cruise missiles against targets on land. According to the Navy, the Seawolf would have many advantages over the SSN-688, including the ability to dive deeper, carry more weapons, and operate more quietly at higher speeds. In addition, it would have advanced sensors for detecting enemy submarines and a more powerful computer system to coordinate sensors and weapons.

In 1992, a combination of budgetary pressures and the end of the Cold War led the Bush Administration to propose canceling the Seawolf program after buying the first vessel. The Congress, however, decided to fund a second submarine, and the Clinton Administration subsequently expressed its support for producing a third Seawolf (designated the SSN-23).

In the Bottom-Up Review, the Administration justified buying the SSN-23 to help preserve the submarine industrial base. The submarine will be purchased to keep open two shipyards capable of producing nuclear-powered submarines. Officials from the Navy argue that keeping both yards with those capabilities ensures the excess capacity needed to produce large quantities of submarines if the threat increases rapidly or for backup production if a catastrophe, such as a fire, befalls one shipyard.

Because the Navy now needs fewer submarines to meet the reduced threat posed by submarines of the former Soviet Union, a seven-year gap in production will exist between authorization of the second Seawolf (1991) and the scheduled authorization date for the Seawolf's successor--the New Attack Submarine (1998). Without new orders for submarines during the 1996-2000 period, General Dynamics' Electric Boat shipyard--one of the two U.S. facilities that produce nuclear-powered submarines--will probably cease production. Department of Defense officials have therefore decided to design and build the third Seawolf at that yard. The survival of Tenneco's Newport News Shipbuilding is not put in jeopardy because it produces aircraft carriers and commercial vessels as well as submarines.

This option would cancel plans to buy the third Seawolf. It could save as much as $1 billion during the 1996-2000 period compared with the Administration's 1995 plan, with most of the savings occurring in 1996.

The Navy expects the SSN-23 to cost about $2.5 billion, and the Congress has already appropriated about $920 million that could be used to purchase the ship. Of the $920 million, about $380 million was appropriated for advance procurement of the ship's combat system and components of the nuclear reactor; the remaining $540 million was appropriated to support the submarine industrial base and to help pay for a third Seawolf. CBO estimates, based on a study for the Department of Defense by RAND, that if the

third Seawolf is not produced, the Navy will incur about $520 million in additional expenses to close down submarine production and restart it to produce the first New Attack Submarine (designated the NSSN) in 1998. The estimated $2.5 billion cost for the third Seawolf minus the $920 million already appropriated and the added costs of approximately $520 million to close down and restart facilities leaves about $1 billion in savings. Because of the great uncertainty in estimating the costs of reconstitution, however, costs could be higher, according to the Office of the Secretary of Defense and Navy officials.

If the SSN-23 was canceled, submarine production could be reconstituted in the future at either Newport News or Electric Boat. The longer the production of the NSSN is delayed, producing it at Newport News becomes a lower-cost alternative than doing so at Electric Boat. Some analysts believe that such a delay is possible because exploring and defining the concept for the basic design of the ship took a year longer than planned. The Navy, however, maintains that construction can still begin in 1998. As production of aircraft carriers progresses at Newport News, workers could begin to transfer from work on the CVN-76 nuclear-powered aircraft carrier to submarines. Moreover, in the longer term, consolidating submarine production at Newport News--the country's largest private shipyard--would probably lower costs significantly by allowing the work force to alternate between carrier and submarine production as needed and by reducing excess naval shipbuilding capacity. In the near term, however, there might be some costs in money and time to amend the design of the NSSN--which is being designed to be produced at Electric Boat--so that it could be produced at Newport News.

In addition to reducing the costs and risks of reconstitution by employing the carrier workforce at Newport News, the Navy might further mitigate these effects by moving some submarine overhauls and modernizations from public shipyards to Newport News. Newport News Shipbuilding already has the facilities to produce, overhaul, and refuel both nuclear-powered carriers and submarines (although some costs might be incurred to restart the dormant facility to refuel submarines). The principal cost of reconstituting the submarine industrial base is that for locating, rehiring, and retraining the workforce. According to the RAND study, the production and overhaul of carriers and the overhaul of submarines would exercise the vast majority of skills required to sustain the industrial base for submarine production, thus significantly reducing the cost and time to reconstitute that capability in the future. Also, overhauling the Navy submarine force could generate more employment than building the SSN-23. France, which produces nuclear-powered submarines at a low rate and experiences large gaps in production between new classes of boats, relies on the construction and overhaul of other ships and the overhaul and modernization of submarines to maintain its submarine production base.

Proponents of the SSN-23 contend that once reconstitution costs are factored in, the savings from canceling the boat are not certain enough to outweigh the risks associated with a plan to reconstitute a shipyard. Proponents also contend that the SSN-23 would maintain the industrial base of submarine subcontractors until the NSSN is built. Buying the SSN-23, however, would not greatly affect maintenance of the industrial base for components used in nuclear propulsion, because most of the funds for the submarine's reactor have already been appropriated for advance procurement. In fact, funding the CVN-76 carrier in 1995 was more crucial to maintaining the base of subcontractors for nuclear components of submarines than buying the SSN-23 would be.

In addition, according to the study by RAND, most suppliers of nonnuclear components could begin producing them again fairly easily after any gap in production. The study noted that the Navy could help keep the other suppliers in business by funding items before they were needed, paying the suppliers to develop a prototype method for manufacturing the items, allocating other Navy work to the firms, or using them to revitalize, modernize, or replace equipment on existing submarines. According to a report by the General Accounting Office, if key subcontractors went out of business, the cost and time to reconstitute production of components could be reduced by having government laboratories or the shipbuilder take over production, as Newport News did with torpedo tubes. Also, the Navy might sign agreements with other nations that produce nuclear-powered submarines--for example, France and the United Kingdom--to buy components from each other.

DEF-07 ELIMINATE FRIGATES FROM THE NAVAL FORCE

Savings from the 1995 Plan	Annual Savings (Millions of dollars)					Cumulative Five-Year Savings
	1996	1997	1998	1999	2000	
Budget Authority	80	240	420	600	780	2,120
Outlays	60	190	340	520	690	1,800

NOTES: This table includes estimated net savings in the federal budget. See Appendix A for estimated savings in the Department of Defense budget.

The Administration has made significant changes to its 1995 plan for this program. See Appendix B for estimated savings compared with the Administration's fiscal year 1996 request.

In addition to aircraft carriers, the primary surface combatants of the U.S. Navy are cruisers, destroyers, and frigates. Cruisers and destroyers often form part of a carrier battle group, escorting and protecting the carrier. Destroyers and frigates can escort the ships of an Amphibious Ready Group, which carries Marine troops and equipment. Frigates also can escort both the Underway Replenishment Groups that resupply naval forces and the convoys of merchant ships that resupply troops fighting in a foreign theater. Under the Administration's 1995 plan, the U.S. Navy projects that it will need 126 cruisers, destroyers, and frigates in its inventory in 1999--116 surface combatants in the active forces and 10 frigates in the reserve forces. Although that number of surface combatants constitutes a significant reduction from about 150 under the Bush Administration's proposed "base force," further reductions are possible.

The Navy's inventory for 1995 includes 49 Oliver Hazard Perry class frigates (FFG-7s). For the Navy to reach its goal of 126 surface combatants by 1999, its 1995 plan would have retired early 16 of the 49 frigates.

This option would reduce the number of surface combatants by retiring early the additional 33 FFG-7s, leaving 93 surface ships in the inventory by 2000. Twenty-three of those 33 FFG-7s would be retired from the active forces and 10 from the Naval Reserve forces. Reductions would be carried out in equal increments from 1996 through 2000. Compared with the 1995 plan, savings could total about $80 million in 1996 and roughly $2.1 billion over the next five years.

Because of a continuing high level of overseas commitments, the Navy recently decided to retain additional FFG-7s in the force instead of retiring them early. Compared with the Administration's plan for 1996 and beyond, which according to CBO estimates will keep 40 FFG-7s by 2000, savings could be $100 million in 1996 and about $2.7 billion over the 1996-2000 period.

Retiring the remaining Perry class frigates would remove this class of ships from the Navy's inventory. Retiring an entire class of ships can substantially reduce expenses for logistics and spare parts. Cutting the number of surface combatants might also permit a cut in the number of combat logistics ships and, hence, in their associated operating and support costs. Those potential savings, however, are not included in this option. Some of the savings in this option would be offset by costs to decommission the ships being retired, but those costs would probably be small.

The favorable security environment today might allow the Navy to reduce forces and invest the savings in new technology. With the dissolution of the Soviet Union, the threats facing Navy ships from enemy aircraft and submarines operating in the open ocean have greatly diminished. The most likely opponents the United States would face in a regional war generally have only modest naval assets and no heavy bombers that could attack U.S. ships at long

ranges. The United States may be able to counter those threats even while substantially reducing the number of surface combatants.

Moreover, the FFG-7 frigates, which specialize in antisubmarine warfare, are the Navy's smallest and least capable surface combatants. Because the submarines of the former Soviet Union have become less of a threat and war in Europe has become much less likely, the United States may no longer need frigates to escort merchant vessels. In addition, because submarines now pose less of a threat to Amphibious Ready Groups and Underway Replenishment Groups in transit to carrier battle groups, fewer surface combatants may be needed as escorts.

Current events, however, may argue against reducing the surface fleet. Under this option, the Navy would have fewer surface combatants to deploy for independent operations not involving carrier battle groups. For example, the Navy has used frigates to conduct naval quarantines, such as that imposed on Haiti. If U.S. naval commitments remain high, operating less complex and lower-cost ships such as frigates might be required to give the Navy the numbers of ships needed to fulfill such missions. Because of its heavy load of current commitments, the Navy's 1996 plan will retain a force of more than 126 surface ships.

DEF-08 REDUCE PROCUREMENT OF DDG-51 DESTROYERS

Savings from the 1995 Plan	Annual Savings (Millions of dollars) 1996	1997	1998	1999	2000	Cumulative Five-Year Savings
Budget Authority	940	950	970	1,010	1,050	4,920
Outlays	50	290	510	730	810	2,390

NOTE: The Administration has made significant changes to its 1995 plan for this program. See Appendix B for estimated savings compared with the Administration's fiscal year 1996 request.

The DDG-51 destroyers of the Arleigh Burke class would be used in a war to protect aircraft carrier battle groups and to attack land- and sea-based targets. The ships incorporate the Aegis combat system for air defense. Compared with previous classes of destroyers, the DDG-51s incorporate other improvements in speed, weapons, and armor. The Navy states that the DDG-51s also will be more difficult for enemy forces to detect because of design features that reduce their radar, sonar, and infrared signatures.

To date, the Congress has funded 32 of the DDG-51s. The Administration's 1995 plan would buy 15 more DDG-51s--three per year from 1996 through 2000--at a total cost of about $14.8 billion. This option would buy only 10 DDG-51s from 1996 through 2000 at a rate of two a year. Compared with the 1995 plan, this option could save about $940 million in 1996 and $4.9 billion over the next five years. Compared with CBO's estimate of the Administration's 1996 plan, which would buy 13 DDG-51s over the next five years, savings would total about $3 billion through 2000. The smaller fleet of DDG-51s in the next decade would also result in savings in operating and support costs that are not included in this option.

Reducing the number of DDG-51s purchased per year could have some disadvantages. Buying fewer DDG-51s might reduce the capabilities of the fleet by providing fewer ships that can perform multiple missions (such as strike and antiair, antisurface, and antisubmarine warfare). With the Navy's post-Cold War policy of deploying its ships more flexibly, which could require that surface combatants sometimes be deployed without an aircraft carrier, such capabilities might be more important.

Moreover, proponents of the Administration's plan might contend that the advanced capabilities of the DDG-51s will continue to be needed in the post-Cold War world. The sophisticated combat systems that the DDG-51 incorporates include the Aegis system, which is designed to stop attacks by large numbers of enemy aircraft and their antiship missiles attempting to saturate the air defenses of the aircraft carrier battle group. The hostile air threat to the U.S. Navy has declined with the breakup of the Soviet Union, and smaller air forces of regional powers that the United States is most likely to fight are less capable of launching saturation attacks. Combat against regional powers, however, is likely to bring ships into littoral areas where they would have less time to react to threats and thus might benefit from the quicker reaction of the Aegis system. Nevertheless, some analysts believe that the DDG-51, which was designed during the Cold War, is not optimally designed to fight in coastal areas and is too expensive to purchase in large numbers if the Navy's budget declines.

Only two shipyards currently build surface combatants, and reducing procurement to two vessels a year might sustain only one producer. The Congress would have to weigh carefully the possible effects of reductions to the country's naval shipbuilding capa-

bilities and the ability to reconstitute them if a change in threat required a buildup of forces.

In addition, savings from reducing purchases could be smaller than estimated under this option if the unit cost per ship rose because overhead was spread over fewer units produced. If reduced purchases caused one shipyard to close, the remaining shipyard might be able to charge higher prices that might offset some or all of the savings from lower production. In addition, if the remaining shipyard had to finish building ships that the closing shipyard had begun, the unit costs of those ships might rise. The government, however, might be able to arrange for the closing shipyard to finish ships under construction before going out of business.

The Navy may be able to minimize such growth in unit costs. Even if only one shipyard remained, the government--a single buyer that has many alternative uses for its limited procurement budget--might be able to exert pressure on that yard to restrain costs. Indeed, one approach that the Navy might take would be to let the two shipyards bid competitively for a single contract covering all 10 ships purchased during the 1996-2000 period. The size of such a contract would guarantee competitive bidding. In the longer term, closing a shipyard might reduce the Navy's costs by eliminating excess naval shipbuilding capacity.

A reduction in the number of DDG-51s, as proposed in this option, need not limit the Navy's ability to counter regional threats. For example, the combination and automation of sensor inputs and weapons in non-Aegis ships may allow them to react faster to the shorter-range threats in regional conflicts. Advances in communications may allow a ship with an advanced Aegis system to control the weapons of all other ships in a group, shortening the reaction time of the entire group.

Considering the reduced threat, the Navy may already have enough sophisticated Aegis ships. With the 69 Aegis ships that would eventually be available under this option (27 authorized CG-47 Ticonderoga class cruisers, 32 authorized DDG-51s, and 10 future DDG-51s), two could be assigned as escorts to each of the 12 aircraft carrier battle groups, leaving 45 available for independent operations. In addition, the Navy would need fewer Aegis ships to escort carrier battle groups if the number of carriers was reduced (see DEF-05) or if lower threat levels warranted assigning only one Aegis ship per battle group. Because of the reduced threat, the Navy is lowering the number of surface combatants assigned to escort and protect the aircraft carrier.

Even with the slower rate of construction in this option, the Navy might still meet its goal for surface combat ships. Under the Administration's 1995 plan, the Navy will seek to maintain a smaller force of about 120 to 126 active and reserve surface combatants (cruisers, destroyers, and frigates). If ships last as long as originally advertised, the Navy could cut its purchases of DDG-51s by five during the 1996-2000 period and still remain well above the goal of 120 to 126 ships by 2010. If the Navy's more recent estimates of a shorter ship life prove correct, the force of surface warships could remain a few ships shy of the goal by that year. In the longer term, however, reducing purchases of DDG-51s to two per year would exacerbate the Navy's ability to retain enough ships to meet the force goal. Should the Navy reduce that goal, buying fewer DDG-51s might be consistent with that reduction.

DEF-09 CANCEL THE UPGRADE OF THE NAVY'S F/A-18 FIGHTER AND BUY THE CURRENT MODEL

Savings from the 1995 Plan	Annual Savings (Millions of dollars)					Cumulative Five-Year Savings
	1996	1997	1998	1999	2000	
Budget Authority	1,040	2,240	2,190	2,260	2,280	10,010
Outlays	480	770	1,240	1,800	2,070	6,360

For the foreseeable future, the F/A-18 aircraft will account for the bulk of the Navy's fleet of carrier-based aircraft that perform fighter and attack missions. The F/A-18 attacks targets both in the air (the fighter mission) and at sea or on the ground (the attack mission). The current version of the F/A-18 is designated the C/D model.

In 1991, the Navy announced plans to develop a new E/F variant of the F/A-18. The E/F version features several modifications: a longer fuselage, a larger wing, and a more powerful engine than are now on the C/D version. Those changes should enable the E/F version to carry a larger load of weapons than the C/D version, or to carry the same load about 50 percent farther. Both attributes are important factors in determining the plane's capability in the attack role. The new engine should also enable the heavier E/F aircraft to retain the speed and maneuverability of the earlier version, important performance considerations in fighter combat.

Though more capable, the E/F version will also be more expensive than the C/D model--about 36 percent more by some estimates--and the Navy will have to pay about $1.6 billion from 1996 through 2000 to develop the plane. This option would cancel development and procurement of the new E/F model and instead would buy sufficient additional C/D aircraft to maintain the Administration's planned production rates. Compared with the 1995 plan, savings would total about $1 billion in 1996 and $10 billion over five years. (Savings from the 1996 plan would be roughly the same as those shown above.) Savings from canceling the upgrade might be even larger if the F/A-18 experiences unanticipated cost increases.

The requirement for an upgraded F/A-18 aircraft may be questionable in view of today's reduced military threat. The threat to carrier battle groups stemmed largely from the former Soviet Union, and the possibility of conflict with the former Soviet republics now seems increasingly remote. Regional powers are not likely to be able to match the capability of current U.S. fighters for many years. But if the enhanced fighter capabilities offered by the E/F version are not needed, neither may be its added attack capabilities, based on the Navy's judgments about other systems. The Navy plans to retire its venerable but longer-range A-6 fleet in 1997 and has canceled development of a new longer-range replacement, the A/FX, at least in part because the service now places less emphasis on the deep strike mission and more on supporting Marine forces that operate at relatively short ranges from the ships that transport and support them. And even if the added capabilities of the E/F model are needed, trends in the F/A-18 program suggest that they may be hard to achieve. Some critics of the program have noted that the A/B model of the F/A-18 attained only about 75 percent of the originally specified goal for the fighter's range, and the C/D model achieved only about 70 percent of the original specification.

Canceling the E/F development program would have some disadvantages. Even in conflicts with smaller nations, improvements in the F/A-18's range, if they materialize, might be useful in the attack mission; indeed, critics of the C/D version believe its relatively short range limits its usefulness. Moreover, now that the A/FX has been canceled, the E/F upgrade will be the only major upgrade the Navy will purchase for its fighter fleet for at least 10 years.

DEF-10 CANCEL THE MARINE CORPS'S V-22 AIRCRAFT PROGRAM AND BUY CH-53E HELICOPTERS

Savings from the 1995 Plan	Annual Savings (Millions of dollars)					Cumulative Five-Year Savings
	1996	1997	1998	1999	2000	
Budget Authority	570	1,120	1,070	1,030	810[a]	4,600
Outlays	360	580	710	800	780[a]	3,230

NOTE: The Administration has made changes to its 1995 plan for this program. See Appendix B for estimated savings compared with the Administration's fiscal year 1996 request.

a. The 1995 plan did not include an estimate for funds for the V-22 program beyond 1999, although procurement would not be completed by then. CBO assumed that DoD would need to spend about $1 billion in 2000 to support planned procurement.

The V-22, a new plane entering production in 1997, is intended to help the Marine Corps perform its amphibious assault mission of seizing a beachhead in hostile territory and its subsequent operations ashore. V-22s will transport up to 24 marines or 10,000 pounds of their equipment, moving either from amphibious ships to the shore or from one shore base to another. The plane employs a "tilt-rotor" technology that enables it to take off and land vertically like a helicopter and, by tilting its rotor assemblies into a horizontal position, become a propeller-driven airplane when in forward flight. The V-22 will be able to fly faster than conventional helicopters; it will also fly longer distances without refueling and thus can "self-deploy" rather than being carried to distant theaters on planes or ships, the common mode of transport for conventional helicopters. The Marine Corps argues that analysis indicates that the V-22's increased speed and other characteristics of its design will make it less vulnerable when flying over enemy terrain.

Despite all of these advantages, the Bush Administration tried to cancel the plane, largely because of its expense. At a projected unit cost of more than $50 million (in 1994 dollars), the V-22 costs considerably more than most conventional helicopters. The V-22's flyaway cost, a price that excludes some items bought with procurement funds, averages about $40 million (also in 1994 dollars)--$5 million less than last year's estimate. The decrease in price is largely due to a reduction in the plane's expected weight, according to Marine Corps personnel.

Notwithstanding the V-22's high cost, the Congress has continued to fund it, and the Clinton Administration's 1996 budget request contains funds to continue development and begin procurement. The Marine Corps plans to procure a total of 425 V-22s. Another 50 planes might eventually be bought for special operations forces, and the Navy plans to buy 48 for combat search-and-rescue missions and for logistics support of its fleet.

At present, the Marines use helicopters to transport personnel and equipment in amphibious missions. One helicopter--the CH-53E, which carries heavier loads than the V-22 and costs about 50 percent as much to procure--will continue to transport Marine equipment even after the V-22 is fielded. The Marines will continue to need some CH-53Es to meet requirements for lifting heavier equipment, but the Administration bought the last of these helicopters in 1994.

This option would cancel the V-22 and continue procurement of CH-53Es. It would buy six CH-53Es per year from 1996 through 2000, half the number bought in 1994. Relative to the Administration's 1995 plan, the option would have saved about $570 million in 1996 and $4.6 billion over five years. Savings from the 1996 plan would be slightly less--$4.2 billion over five years. In addition to saving money, buying CH-53Es might entail less risk than developing a V-22. Two of five V-22 prototypes have crashed, as has one of two XV-15 aircraft built to demonstrate tilt-rotor technology. The Marine Corps